

SMART: Self management supported by Assistive, Rehabilitation and Telecare Technologies <http://www.thsmartconsortium.org/>

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Background: Chronic ill health frequently results in unemployment, social withdrawal, fears over an uncertain future and an increasing dependence upon health and social care services. Consequently, the treatment and care of people with long term conditions consumes a large, and potentially unsustainable, proportion of health and social care resources (DoH 2001). Self management involves encouraging the person with a long term condition to solve problems, take decisions, locate and use resources, identify an action plan and take action to manage their condition (Lorig & Holman, 2004). Concerns regarding the increasing prevalence of long term conditions; the severity and complexity of patient need; the rising costs of traditional face-to-face healthcare delivery; and a philosophical move towards promoting self reliance and patient empowerment have led to the introduction of self management initiatives in many countries. In the UK self management is central to the Government's long term conditions agenda and is exemplified by The Expert Patient Programme (DoH 2001). However, it is only relatively recently that consideration has been given to other services, and in particular home or community located technologies that might be developed to assist the person with the task involved in managing their own condition (RCP 2004, DoH 2005).

Aim: The aim of our project is to deepen understanding of the potential for technology in the support of self management through creating user-centred designs for technology. The project aim is being taken forward through a four year plan of research (which commenced in January 2008) to address the following questions:

How can changes in chronic conditions be fed back to users in a meaningful and usable way? How can information, remote from a therapist be presented to promote behaviour change? How does this information allow people to adjust their life goals?

We are working towards producing a prototype personalised self-management system (PSMS) incorporating commonly encountered technologies such as triaxial accelerometry, pedometry and lifestyle or activity monitoring. The PSMS will be configured to be intelligent and will be customised to assist people with three long term conditions; stroke, chronic pain and chronic heart failure to self manage their physical activity. We will then conduct extensive studies of the technology in use.

Proposed architecture of Personalised Self Management System

Patients' information monitored by a number of sensors together with therapeutic information and library of life goals will create a series of patient's profiles. Each profile will be analysed by an expert system which provides advice and feedback to the users. Health care professionals will be able to review the care plan and to advise the change of life goals from a remote location (Zheng, et al. 2008). Available from:

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Methods: We have commenced consultation with people with one of the three long term conditions, their carers and clinicians, using a range of qualitative research methods. Data is being gathered through a series of participatory focus groups, one-to-one in-depth interviews and non-participant observation. The next step is to undertake home ethnographies (Blythe, et al. 2002) and cultural probes (Gaver, et al. 1999) to produce a collection of personae and scenarios in order to inform concept design and the subsequent iterative prototyping design. Successive prototypes based on user needs will then be tested in design workshops. Three evidence based reviews are currently being completed to inform PSMS development; the first to identify likely technologies for inclusion within the PSMS; the second to inform the therapy content of the system; and the third to consider how technologies might be incorporated into future services. Laboratory testing of promising technologies has also commenced to establish reliability, accuracy and useability.

Results to date: Initial focus groups with therapists and clinicians (led by clinical and design researchers) yielded ideas of how technology might be used to facilitate assessment, goal setting and outcome measurement. Participants envisioned the "ideal technology" which would be capable of improving the quality of therapy patients receive. Therapy content identified for inclusion within the PSMS included core stability and repetitive task-training activities. Activity monitoring technology was welcomed by health professionals to identify therapeutic interventions to promote changes in behaviour. Likely technologies which have been identified and are currently undergoing laboratory testing include an intelligent shoe to monitor symmetry and balance, personalised wearable sensors to measure level of activities and vital signs monitoring.

Figure 1. Architecture of the PSMS

